

CLAIMS:

1. A method for controlling a hydraulic pump for a working machine of a working vehicle having a cylinder (60)
5 for operating the working machine (10) and the hydraulic pump (26) for supplying predetermined pressure oil to said cylinder (60), comprising the steps of:
 - measuring a duration time of a state in which a hydraulic pressure in a bottom side (13A) of at least one
10 cylinder (13) of said cylinder (60) is at a predetermined value or less;
 - determining that an excavating operation starts when a predetermined duration time elapses and thereafter, the hydraulic pressure in said bottom side (13A) exceeds the
15 predetermined value;
 - setting a displacement of said hydraulic pump (26) at a predetermined displacement reduced to be smaller than a maximum displacement; and
 - performing a control to reduce the displacement of
20 said hydraulic pump (26) to the predetermined displacement.
2. The method for controlling the hydraulic pump for the working machine of the working vehicle according to Claim 1, further comprising the steps of:
 - 25 determining that the excavating operation is finished

when forward and reverse travel operating means (30) of said working vehicle (1) is switched to a neutral or reverse travel position from a forward travel position, on performing a control by reducing the displacement to the predetermined
5 displacement; and

stopping the control to reduce the displacement of said hydraulic pump (26) to the predetermined displacement.

3. The method for controlling the hydraulic pump for the
10 working machine of the working vehicle according to Claim 1, further comprising the steps of:

determining that the excavating operation is finished when the hydraulic pressure in said bottom side (13A) becomes a predetermined value or less within a first set time
15 previously set from the time of determining the start of the excavation operation, on performing a control by reducing the displacement to the predetermined displacement; and

stopping the control to reduce the displacement of said hydraulic pump (26) to the predetermined displacement.

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4. The method for controlling the hydraulic pump for the working machine of the working vehicle according to Claim 1, further comprising the steps of:

determining that the excavating operation is finished
25 when the hydraulic pressure in said bottom side (13A)

becomes a predetermined value or less, and a hydraulic pressure state of the predetermined value or less continues for more than a second set time previously set from the time of determining the start of the excavating operation, on

- 5 performing a control by reducing the displacement to the predetermined displacement; and

stopping the control to reduce the displacement of said hydraulic pump (26) to the predetermined displacement.

- 10 5. The method for controlling the hydraulic pump for the working machine of the working vehicle according to Claim 1, further comprising the steps of:

determining that the excavating operation is finished when a height of a bucket (12) of said working machine (10)

- 15 becomes a predetermined value or more, on performing a control by reducing the displacement to the predetermined displacement; and

stopping the control to reduce the displacement of said hydraulic pump (26) to the predetermined displacement.

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6. An apparatus for controlling a hydraulic pump for a working machine of a working vehicle having a cylinder (60) for operating a working machine (10) and a variable displacement hydraulic pump (26) for supplying
- 25 predetermined pressure oil to said cylinder (60), comprising:

a bottom pressure detector (45) for detecting a hydraulic pressure in a bottom side (13A) of at least one cylinder (13) of said cylinder (60);

a displacement control device (41) for controlling a displacement of said variable displacement hydraulic pump (26); and

a controller (50) which inputs a detection value from said bottom pressure detector (45) therein, determines that an excavating operation starts when a predetermined time elapses with said detection value at a predetermined value or less and thereafter, said detection value exceeds the predetermined value, and outputs a displacement control signal for reducing the displacement of said variable displacement hydraulic pump (26) to a predetermined displacement that is smaller than a maximum displacement to said displacement control device (41).

7. The apparatus for controlling the hydraulic pump for the working machine of the working vehicle according to Claim 6,

wherein said controller (50) inputs therein a detection signal from operation position detecting means (31) for detecting an operation position of forward and reverse travel operating means (30) provided at said working vehicle (1), and stops transmission of said displacement control signal to

said displacement control device (41) when the operation position is switched to a neutral or reverse travel position from a forward travel position.

- 5 8. The apparatus for controlling the hydraulic pump for the working machine of the working vehicle according to Claim 6,

 wherein said controller (50) determines that the excavating operation is finished when said detection value
10 from said bottom pressure detector (45) becomes the predetermined value or less within a first set time previously set, after determining that the excavation operation starts, and stops transmission of said displacement control signal to said displacement control device (41).

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9. The apparatus for controlling the hydraulic pump for the working machine of the working vehicle according to Claim 6,

 wherein said controller (50) determines that the
20 excavating operation is finished when said detection value from said bottom pressure detector (45) becomes the predetermined value or less, after determining that the excavation operation starts, and a state at the predetermined value or less continues for more than a second set time
25 previously set, and stops transmission of said displacement

control signal to said displacement control device (41).

10. The apparatus for controlling the hydraulic pump for the working machine of the working vehicle according to

5 Claim 6, further comprising:

a bucket height detector (32) for detecting a height of a bucket (12) of said working machine (10),

wherein said controller (50) inputs therein said bucket height from said bucket height detector (32) after determining
10 that the excavation operation starts, and determines that the excavating operation is finished when said bucket height becomes a predetermined value or more, and stops transmission of said displacement control signal to said displacement control device (41).

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11. An apparatus for controlling a hydraulic pump for a working machine of a working vehicle having a cylinder (60) for operating the working machine (10), a variable displacement hydraulic pump (26B) for supplying
20 predetermined pressure oil to said cylinder (60), a control valve (44B) for controlling a flow rate of pressure oil supplied to predetermined cylinders (13, 13) in said cylinder (60) and a working machine operating lever (55), comprising:

a bottom pressure detector (45) for detecting a
25 hydraulic pressure in a bottom side (13A) of at least one

cylinder (13) of said predetermined cylinders (13, 13);

a displacement control device (41B) for controlling a displacement of said variable displacement hydraulic pump (26B) so that a load sensing differential pressure that is

5 differential pressure of a load pressure of said predetermined cylinders (13, 13) and a discharge pressure of said variable displacement hydraulic pump (26B) becomes constant; and

a controller (50B) which inputs therein a detection value from said bottom pressure detector (45), determines that
10 an excavating operation starts when a predetermined time elapses with said detection value at a predetermined value or less and thereafter, said detection value exceeds a predetermined value, and reduces a stroke of said control valve (44B) for a maximum stroke of said working machine
15 operating lever (55) to be a smaller predetermined stroke than a maximum stroke.